



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,492	12/08/2003	Hung M. Pham	0315-000451/COL	2545
27572	7590	01/11/2005	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			TANNER, HARRY B	
			ART UNIT	PAPER NUMBER
			3744	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

SP

**Office Action Summary**

Application No.

10/730,492

Applicant(s)

PHAM ET AL.

Examiner

Harry B. Tanner

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 13-33 is/are rejected.
- 7) ☒ Claim(s) 11 and 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                             |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)         |
| Paper No(s)/Mail Date: _____  | 6) <input checked="" type="checkbox"/> Other: <u>terminal disclaimer approval</u> . |

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 8, 9 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al in view of Nagatomo et al and Alsenz (5,035,119). Yoshikawa discloses the invention substantially as claimed. Yoshikawa discloses a refrigeration system having a condenser 3, compressor 2, load sensor 43, liquid-side expansion valve 28 operated by a stepper motor 28 and controller 49,50 responsive to the load sensor for modulating both the compressor capacity and the expansion valve opening in order to provide the proper level of refrigeration. Nagatomo teaches the use of a pulse width modulated variable capacity in order to provide adjustable compressor capacity for a refrigeration system. Alsenz teaches the use of pulsing a solenoid to operate an expansion valve. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Yoshikawa such that it included the use of a pulse width modulated variable capacity compressor to provide the adjustable compressor capacity rather than the variable speed compressor in view of the teachings of Nagatomo and the use of a pulsing solenoid to operate the expansion valve rather than a stepper motor in view of the teachings of Alsenz. It is inherent in a duty cycle control system that the duty cycle time period will be shorter than the time constant of the load in order for the control system to work properly.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al in view of Nagatomo et al and Alsenz (5,035,119) as applied to claim 1 above, and further in view of Takizawa et al. Takizawa teaches the use of suction-side pressure regulator 14 in order to provide the proper level of refrigeration. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Yoshikawa such that it included use of a suction-side pressure regulator 14 in order to provide the proper level of refrigeration in view of the teachings of Takizawa.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al in view of Nagatomo et al and Alsenz (5,035,119) as applied to claim 1 above, and further in view of Tanaka. Tanaka teaches the use of capacity control in which cooling capacity is varied between hundred percent and zero percent. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Yoshikawa such that it included the use of capacity control in which cooling capacity is varied between hundred percent and zero percent in view of the teachings of Tanaka.

Claims 2 and 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al in view of Nagatomo et al and Alsenz (5,035,119) as applied to claim 1 above, and further in view of Bendtsen. Bendtsen teaches the use of both temperature 8 and pressure 11 sensors for control of the capacity of a cooling system. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Yoshikawa such that it included the use of

both temperature and pressure sensors for control of the capacity of the cooling system to in view of the teachings of Bendtsen. It is inherent that various parameters of a refrigeration system will have different rates of change.

Claims 17-19, 22-23, 25, 27-28 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al in view of Nagatomo et al and Alsenz (5,035,119) as applied to claim 1 above, and further in view of Schaeffer et al.

Schaeffer teaches the use of refrigeration system for cooling multiple refrigeration cases and the use of scroll compressor in refrigeration systems. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the system of Yoshikawa such that it included the used to cool multiple refrigeration cases and with respect to claim 32 to use a scroll compressor in the refrigeration system in view of the teachings of Schaeffer.

Claims 20-21, 26 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al in view of Nagatomo et al al, Alsenz (5,035,119) and Schaeffer et al as applied to claim 17 above, and further in view of Bendtsen as applied to claim 2 above.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al in view of Nagatomo et al, Alsenz (5,035,119) and Schaeffer et al as applied to claim 17 above, and further in view of Tanaka as applied to claim 10 above.

Claims 11-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant's arguments filed on 10/27/04 have been fully considered but they are not persuasive. For example, with respect to applicant's contention that Nagatomo et al does not teach capacity control of a compressor in response to a variable duty cycle control signal, it is noted that valve 9 is operated in response to a variable duty cycle control signal and controls the position of internal valve 43 of the compressor. Accordingly, the compressor capacity is being controlled in response to a variable duty cycle control signal. Yoshikawa discloses controlling both the compressor and the expansion valve in response to a cooling demand signal. It is the examiner's position that using alternative means for controlling the compressor capacity and valve opening, specifically by using duty cycle control, would have been obvious to one of ordinary skill in the art at the time the invention was made.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry B. Tanner whose telephone number is (571) 272-4813. The examiner can normally be reached 8:30 am to 6:00 pm Monday, Tuesday, Wednesday and Friday and 2:00 pm to 6:00 pm Thursday.

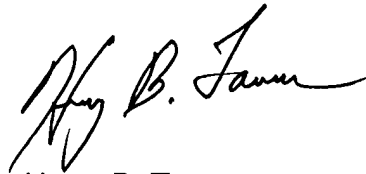
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Denise Esquivel, can be reached on (571) 272-4808. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status

Art Unit: 3744

information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://portal.uspto.gov/external/portal/pair>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Harry B. Tanner". The signature is fluid and cursive, with the first name "Harry" being more prominent.

Harry B. Tanner  
Primary Examiner  
Art Unit 3744